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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,206	11/26/2003	Michael A. Gaynes	FR920030002US1	1205

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EXAMINER	
IM, JUNGHWA M	

ART UNIT	PAPER NUMBER
2811	

NOTIFICATION DATE	DELIVERY MODE
06/25/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/707,206	GAYNES ET AL.	
	Examiner	Art Unit	
	JUNGHWA M. IM	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,10,23,25,26 and 34-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10,23,25,26 and 34-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation implying that a gap is substantially filled with the conductive structures and the adhesive materials and at the same time the gap is remained void. Note that the claim recites that a gap is defined between the chip carrier and a portion of the conductive lid which the another adhesive material is applied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 10, 23, 25, 26, 34-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baba (US Pat. 6,313,521) in view of Dahl (US Pat. 6,051,888) and Jimarez et al. (US Pat. 6,407,334), hereinafter Jimarez.

Regarding claim 1, insofar as understood, Fig. 5B of Baba shows a semiconductor package comprising:

a chip carrier [1] including a grounded pad on a first side of said chip carrier (col. 8, lines 17-35);

a semiconductor chip [2] coupled to said first side of said chip carrier;

a picked and placed conductive lid [13; col. 7, lines 29-31] thermally coupled to said semiconductor chip wherein the entire length of said conductive lid is substantially parallel with said first side of said chip carrier;

an end of said conductive lid extends beyond at least one side of said semiconductor.; and

a conductive structure [10; col. 7, lines 18-22] electrically coupled to said grounded pad and to said conductive lid (col. 8, lines 17-35).

Fig. 5B of Baba shows most aspects of the instant invention except that a gap between a chip carrier and a conductive lid is coupled by discrete conductive structures and the conductive structure has about the same dimensions as a discrete chip component. Fig. 1 of Dahl shows a discrete chip component can be formed in the opening portion (21) in the heat sink (17). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Dahl into the device of Baba in order to have a discrete chip component formed in the opening portion in the heat sink, there resulting in a discrete conductive structure having about the same dimensions as a discrete chip component for compact package.

The combination of Baba/Dahl shows most aspects of the instant invention except a gap between a chip carrier and a conductive lid is coupled by discrete conductive structures. Fig. 10 of Jimarez shows that a gap between a chip carrier (10) and a conductive lid (46) is coupled by discrete conductive structures. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Jimarez into the device of Baba/Dahl in order to have a gap between a chip carrier and a conductive lid coupled by discrete conductive structures for heat transfer.

Regarding claim 2, Fig. 5B of Baba shows that a solder (11; silver paste; col. 7, lines 18-22) connects said conductive structure and said grounded pad.

Regarding claim 3, Fig. 5B of Baba shows that said conductive structure electrically coupled to said grounded pad with an electrically conductive adhesive material (silver paste; col. 7, lines 18-22 and col. 8, lines 17-35).

Regarding claim 4, Fig. 5B of Baba shows that conductive structure is electrically coupled to said conductive lid with an electrically conductive adhesive material (14; silver paste; col. 8, lines 17-35).

Regarding claim 5, Fig. 5B of Baba shows that said conductive structure is coupled to said chip carrier using an electrically insulative adhesive material (insulating epoxy resin; col. 8, lines 29-35).

Regarding claim 6, Fig. 5B of Baba shows that said conductive structure is coupled to said chip carrier using a thermally conductive adhesive material (11; silver paste; col. 7, lines 18-22).

Regarding claim 10, Fig. 10 of Jimarez shows that a solder couples said conductive structure [40] to said grounded pad (col. 2, lines 40-43), an electrically conductive adhesive material [42] couples said conductive structure to said conductive lid; and an electrically insulative adhesive material couples [18; col. 2, lines 14-16] said conductive structure to the chip carrier.

Regarding claim 23, Fig. 10 of Jimarez shows the conductive structures are located on the first side of the chip carrier.

Regarding claim 25, Fig. 5B of Baba shows that said conductive structure occupies a substantial amount of a gap between a lower surface of said conductive lid and an upper surface of said chip carrier.

Regarding claim 26, the combination of Baba/Dahl/Jimarez fails to show "said conductive structure occupies about 90% of said gap." However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the conductive structure occupying about 90% of said gap in order to reduce the package size since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 34, Fig. 1 of Jimarez shows no part of said conductive structures (24) are aligned with said end of said conductive lid.

Regarding claim 35, the combination of Baba/Dahl/Jimarez shows between said chip carrier and said conductive lidd, only said conductive structures and said adhesive

materials physically support portions of said conductive lid that extend beyond said semiconductor chip.

Regarding claim 36, Fig. 1 of Jimarez shows said conductive structures comprise blocks.

Regarding claim 38, the combination of Baba/Dahl/Glenn would show that said conductive spring has about the same dimensions as a surface mount technology (SMT) discrete component since the teaching of Dahl would shows discrete chip [154] component having about the same dimensions as the conductive structure [156].

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baba in view of Dahl and Jimarez as applied to claim 1 above, and further in view of Glenn et al. (US 6,562,655), hereinafter Glenn.

Regarding claim 37, Fig. 5B of Baba shows a semiconductor package comprising:

a chip carrier [1] including a grounded pad on a first side of said chip carrier (Abstract);

a semiconductor chip [2] coupled to said first side of said chip carrier;

a picked and placed conductive lid [13] thermally coupled to said semiconductor chip wherein the entire length of said conductive lid is substantially parallel with said first side of said chip carrier; and

a conductive element [10; col. 7, lines 18-22] electrically coupled to said grounded pad and to said conductive lid (col. 8, lines 17-35).

Fig. 5B of Baba shows most aspects of the instant invention except that a gap between a chip carrier and a conductive lid is coupled by discrete conductive structures and the conductive structure has about the same dimensions as a discrete chip component. Fig. 1 of Dahl shows a discrete chip component can be formed in the opening portion (21) in the heat sink (17). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Dahl into the device of Baba in order to have a discrete chip component formed in the opening portion in the heat sink, there resulting in a discrete conductive structure having about the same dimensions as a discrete chip component for compact package.

The combination of Baba/Dahl shows most aspects of the instant invention except a gap between a chip carrier and a conductive lid is coupled by discrete conductive structures. Fig. 10 of Jimarez shows that a gap between a chip carrier (10) and a conductive lid (46) is coupled by discrete conductive structures. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Jimarez into the device of Baba/Dahl in order to have a gap between a chip carrier and a conductive lid coupled by discrete conductive structures for heat transfer.

The combination of Baba/Dahl/Jimaez shows substantially the entire claimed structure except "a conductive spring." Fig. 6 of Glenn shows a semiconductor with a

conductive structure comprising a spring [150]. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Glenn into the device of Baba/Dahl/Jimaez in order to have a conductive structure comprising a spring to secure the conductive lid.

Response to Arguments

Applicant's arguments with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUNGHWA M. IM whose telephone number is (571)272-1655. The examiner can normally be reached on MON.-FRI. 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

/J. M. I./
Examiner, Art Unit 2811